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(54) **Auction system and method**

(57) A host apparatus of a financial auction system is disposed in a site that is accessible from user terminal apparatuses through the transmission line of a network. The host apparatus has a borrowing agent (22) serving as the window for a potential borrower, a lending agent (24) serving as the window for a potential lender, a screening section (26) for extracting a potential lending offer matching a predetermined condition, a matchmaking section (28) for selecting a successful bid from potential lending offers, and an information collection section (32) for collecting background information of a potential borrowing request. A database (40) is attached to the host apparatus, where a borrowing request file (42), lending offer file (44), and background information file (46) are formed.

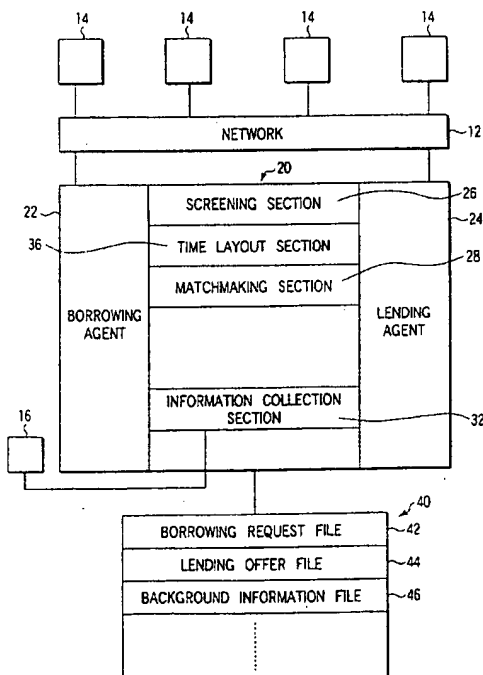


FIG. 1

Description

[0001] The present invention relates to an auction system for making match between a person who wants to obtain a loan, i.e., a potential borrower, and a person who wants to finance a loan, i.e., a potential lender through a network, and a method therefor.

[0002] Normally, a company which wants to obtain a loan requests it to a specialized financier such as a bank or a nonbank financial organization. However, as is represented by the problem of credit crunch for small and medium companies, the current financing method in Japan has several problems as will be described below.

[0003] First, in association with credit limit decision (decision of risk that a company bankrupts to be unable to repay), there is a large time lag between the financing requiring time and the actual financing time. In addition, the fund supply route for risky financing has multiple stages, and the distribution cost therein makes the risk premium too larger. Furthermore, since the indirect financing system is employed, individual assets that are supposed to be able to bear the risk cannot select the borrower, so the acceptable risk of the assets is limited.

[0004] For these reasons, even a superior company eligible for a loan at an interest lower than the market average must pay a high interest or cannot be financed in some cases. In addition, an unsecured loan from a nonbank financial organization requires a higher interest payment. As described above, companies in Japan must pay unnecessarily high interests, and this probably impedes development of domestic industries.

[0005] The present invention has been made in consideration of the above conventional problems, and has as its object to provide a new auction system for directly connecting a person who wants to obtain a loan and a person who wants to finance a loan, and a method therefor.

[0006] According to a first aspect of the present invention, there is provided an auction system comprising:

a section configured to input a plurality of potential borrowing requests each including a desired borrowing amount and a maximum allowable interest;

a section configured to input a plurality of potential lending offers each including a desired lending amount and a desired lending interest; and

a section configured to perform matching between the potential borrowing requests and the potential lending offers on the basis of the respective maximum allowable interests and desired lending interests and to make the desired lending amount of a potential lending offer extracted as a result of matching correspond to the desired borrowing amount of a potential borrowing request extracted as a result of matching.

[0007] According to a second aspect of the present invention, there is provided an auction system comprising:

a borrowing intermediacy section configured to receive a potential borrowing request including a desired borrowing amount and a maximum allowable interest;

a borrowing request storage section configured to register the potential borrowing request;

a lending intermediacy section configured to receive a plurality of potential lending offers each including a desired lending amount and a desired interest or a rule capable of calculating the desired interest;

a lending offer storage section configured to register the potential lending offers; and

a matchmaking section configured to select a set of successful bids in ascending order of the desired interests from the potential lending offers within a range not more than the maximum allowable interest until the desired borrowing amount is satisfied.

[0008] According to a third aspect of the present invention, there is provided an auction method comprising the steps of:

inputting a plurality of potential borrowing requests each including a desired borrowing amount and a maximum allowable interest;

inputting a plurality of potential lending offers each including a desired lending amount and a desired lending interest; and

performing matching between the potential borrowing requests and the potential lending offers on the basis of the respective maximum allowable interests and desired lending interests and making the desired lending amount of a potential lending offer extracted as a result of matching correspond to the desired borrowing amount of a potential borrowing request extracted as a result of matching.

[0009] According to a fourth aspect of the present invention, there is provided an auction method comprising the steps of:

receiving a potential borrowing request including a desired borrowing amount and a maximum allowable interest;
 registering the potential borrowing request;
 receiving a plurality of potential lending offers each including a desired lending amount and a desired interest;
 registering the potential lending offers;
 5 extracting a potential lending offer for which the desired interest is not more than the maximum allowable interest
 from the potential lending offers; and
 selecting a set of successful bids in ascending order of the desired interests from the extracted potential lending
 offers until the desired borrowing amount is satisfied.

10 [0010] According to the present invention, a new auction system for directly connecting a person who wants to obtain
 a loan and a person who offers financing/ investment, and a method therefor can be provided.

[0011] This summary of the invention does not necessarily describe all necessary features so that the invention may
 also be a sub-combination of these described features.

15 [0012] The invention can be more fully understood from the following detailed description when taken in conjunction
 with the accompanying drawings, in which:

FIG. 1 is a block diagram showing a financial auction system according to an embodiment of the present invention;
 FIG. 2 is a flow chart showing the process of a financial auction using the system shown in FIG. 1;

20 FIG. 3 is a view showing the concept of matchmaking based on one potential borrowing request and three potential
 lending offers;

FIG. 4 is a view showing the concept of matchmaking based on two potential borrowing requests and three potential
 lending offers;

FIG. 5 is a block diagram showing a financial auction system according to another embodiment of the present
 invention;

25 FIG. 6 is a flow chart showing the process of a financial auction using the system shown in FIG. 5;

FIG. 7 is a block diagram showing a financial auction system according to still another embodiment of the present
 invention;

FIG. 8 is a view showing the concept of joint repayment by two borrowers and three lenders;

FIG. 9 is a flow chart showing the process of one-to-many matching scheme;

30 FIG. 10 is a flow chart showing the process of many-to-many matching scheme;

FIG. 11 is a flow chart showing the process from member registration of a user to an agreement;

FIG. 12 is a view showing an interface for membership application;

FIG. 13 is a view showing an interface for inputting accounting information;

FIG. 14 is a view showing an interface for borrowing application;

35 FIG. 15 is a view showing an interface for confirming an agreement; and

FIG. 16 is a view showing an interface for confirming an agreement.

40 [0013] The embodiments of the present invention will be described below with reference to the accompanying draw-
 ing. The same reference numerals denote components having almost the same functions and arrangements in the
 following description, and a description will be repeated only if it is necessary.

(First Embodiment)

45 [0014] FIG. 1 is a block diagram showing a financial auction system according to an embodiment of the present
 invention.

50 [0015] In this embodiment, a host apparatus 20 of the financial auction system is disposed in a site that is accessible
 from user terminal apparatuses 14 such as personal computers through the transmission line of a network 12 and,
 more particularly, the Internet (public communication line network). The host apparatus 20, i.e., the host computer (web
 server, application server, and database server) has a borrowing agent 22 (borrowing intermediacy means) serving as
 the window for a person (potential borrower) who presents a potential borrowing request, and a lending agent (lending
 intermediacy means) 24 serving as the window for a person (potential lender) who presents a potential lending offer.
 The host apparatus 20 also has a screening section 26 (screening means) for extracting a potential lending offer or
 potential borrowing request matching a predetermined condition, a matchmaking section 28 (matchmaking means) for
 selecting a successful bid from potential lending offers, and an information collection section 32 for collecting back-
 ground information of a potential borrowing request.

55 [0016] A database 40 is attached to the host apparatus 20. The database 40 has a borrowing request file 42, lending
 offer file 44, and background information file 46. The borrowing request file 42, lending offer file 44, and background
 information file 46 store potential borrowing requests, potential lending offers, and background information of potential

borrowing requests, respectively. This system configuration is merely an example, and a system which is the same in terms of concept can also be realized by distributed processing of a plurality of computers.

[0017] FIG. 2 is a flow chart showing the process of a financial auction using the system shown in FIG. 1. This will be described below with reference to FIG. 2.

[0018] For a user (potential borrower or potential lender) who has accessed the host apparatus 20 from the user terminal apparatus 14, the process advances from member registration of the user to an agreement as indicated by the outline (flow chart) shown in FIG. 11. After "member registration application" (S70), the user is registered as a regular member (S71). FIG. 12 is a view showing an interface for membership application. The potential borrower inputs information related to the borrowing request (to be described later) (S72 and S73) and enters an auction. After the auction has been concluded, the lender is confirmed (S74), and the agreement is made (actual agreement) (S75). This will be described in detail.

[0019] The user who has ended user registration selects a borrowing request or lending offer in FIG. 2 (S1). If the user is a potential borrower (S2), pieces of information related to the borrowing request are input from the terminal apparatus 14 to the borrowing agent 22. First, the potential borrower is obligated to input pieces of background information (primary information) to the borrowing agent 22 (S4) (FIG. 13). These pieces of background information include information of accounting, profile, and the like of the potential borrower (entity of the request). These pieces of information are written in the background information file 46 through the information collection section 32. On the other hand, pieces of background information (secondary information) of the potential borrower are acquired/collected through an external agency 16 such as a credit investigation company or rating organization (S4) and written in the background information file 46 through the information collection section 32. Next, the potential borrower inputs pieces of information such as the desired borrowing amount and maximum allowable interest (FIG. 14) related to the potential borrowing request and a request about screening (to be described below in detail) (S5). These pieces of information are written in the borrowing request file 42.

[0020] On the other hand, if the user is a potential lender (S3), pieces of information related to the lending offer are input from the terminal apparatus 14 to the lending agent 24. As in the above-described case, the potential lender inputs pieces of background information (primary information) to the lending agent 24 (S6). The pieces of input primary information are written in the background information file 46 through the information collection section 32. On the other hand, pieces of background information (secondary information) of the potential lender are acquired/collected through the external agency 16 such as a credit investigation company or rating organization (S6) and written in the background information file 46 through the information collection section 32. The potential lender inputs the desired lending amount and desired interest related to the potential lending offer and a request about screening (S7). These pieces of information are written in the lending offer file 44.

[0021] Either of the potential borrowing request input and potential lending offer input can be done first in setting a predetermined auction.

[0022] Next, the screening section 26 and matchmaking section 28 perform screening (S8) and matchmaking (S9) related to the potential borrowing request and potential lending offer. Screening by the screening section 26 will be described first.

[0023] Screening is a function of narrowing down the matchmaking targets on the basis of the background information of the potential borrower and potential lender. Screening is done under the composite condition of conditions set by the potential borrower and potential lender to select matchmaking targets. With the condition setting function, the conditions of the potential borrower and potential lender can be designated using the primary information directly input by the potential lender and the secondary information extrapolated or processed by various agencies.

1. Primary Information

1) Screening by Accounting Information

[0024] The potential lender (or potential borrower) selects a potential borrower (or potential lender) by designating the numerical range of accounting information. In addition, the potential lender can select a potential borrower on the basis of a grade representing the degree of confidence of statement of accounts, such as the presence/absence of a continuous audit report.

2) Screening by Profile

[0025] The potential lender (or potential borrower) can select a potential borrower (or potential lender) in accordance with attribute information such as nationality, industrial classification, business history, transactions or capital relationship with large companies, and the presence/absence of a successor.

2. Secondary Information

1) Screening by Rating

[0026] The potential lender (or potential borrower) can select a potential borrower (or potential lender) on the basis of the grade of rating extrapolated by a rating organization. In addition, the potential lender can select a potential borrower as a matchmaking target by designating simple rating representing the risk of a portfolio.

2) Screening by Scoring

[0027] The potential lender (or potential borrower) can select a potential borrower (or potential lender) by an index defined by each company. For example, selection can be done using an index defined from the viewpoint of, e.g., the degree of confidence, outlook for growth, ecological policy, black information (marked client), regional characteristics, and industrial classification characteristics. As such indices, secondary information formed by processing primary information or an index generated by unique investigation by each company can be extrapolated.

3) Screening by Degree of Confidence of Data Source

[0028] The potential lender selects a potential borrower on the basis of a grade representing the degree of confidence of the agency that has input the primary information.

[0029] Matchmaking (S9) by the matchmaking section 28 will be described next.

[0030] Potential lending offers for which the desired interest is equal to or lower than the maximum allowable interest of the potential borrowing request are extracted from potential lending offers. Until the desired borrowing amount of the potential borrowing request is satisfied, successful bids are selected from the extracted potential lending offers in ascending order of desired interests. A choice for matchmaking is substantially parallelly done for all potential borrowing requests and potential lending offers registered in the borrowing request file 42 and lending offer file 44. However, when a plurality of potential borrowing requests are present, a potential borrowing request whose maximum allowable interest is high is preferentially selected, and a successful bid is sequentially made for potential borrowing requests in descending order of maximum allowable interests.

[0031] The above-described rules in matchmaking can be changed as needed. For example, a financial setting interest may be changed in units of potential lending offers or equalized to the highest desired interest. Alternatively, when a plurality of potential borrowing requests are present, a successful bid may be sequentially made for potential borrowing requests in ascending order of maximum allowable interests (The borrowing maturity and lending maturity are not taken into consideration here. Actually, matchmaking is done in consideration of the borrowing maturity and lending maturity. The following example will be described assuming that the borrowing maturity and lending maturity are fixed (e.g., one year)).

[0032] If lending interests are different, processing in case of bankruptcy is taken into consideration so that, for example, the collecting priority in case of bankruptcy of the borrower is given in ascending order of interests.

[0033] As the first example of the financial auction, a case wherein one potential borrowing request A1 (company A1) and four potential lending offers B1 to B4 (investors B1 to B4) are subjected to matchmaking, as shown in Table 1, will be described in detail with reference to FIG. 9 (one-to-many matching scheme).

Table 1

Potential borrower	Potential lender
Company A1	Investor B1
Desired amount,	Upper limit of loan,
¥10,000,000	¥3,000,000
Interest rate condition, 5% or less	Desired interest 3%
	Investor B2
	Upper limit of loan,
	¥5,000,000
	Desired interest 4%
	Investor B3

Table 1 (continued)

Potential borrower	Potential lender
	Upper limit of loan, ¥5,000,000 Desired interest 5%
	Investor B4 Upper limit of loan, ¥7,000,000 Desired interest 6%

[0034] First, the maximum allowable interest (5% or less) of the company A1 is compared with each of the desired lending interests (3%, 4%, 5%, and 6%) of the potential lenders (S50). The investor B4 falls outside the allowance and is rejected (S51). If the desired borrowing amount is larger than the desired lending amount (S52), the desired lending amounts of the investors B1 to B3 are rewritten to the desired borrowing amount by pre-processing (S53). In this example, pre-processing is unnecessary. Next, the investors are put to the entry sequentially from the upper class (low interest offer) of the offered lending conditions until the amount reaches the desired borrowing amount (S54). A portion beyond the desired borrowing amount (¥3,000,000 of the investor B3) is removed from the entries (S55).

[0035] Thus, matching is determined as shown in Table 2. In this example, the potential borrowing request A1 consequently has whole matchmaking with the potential lending offer B1 with the lowest desired interest and the potential lending offer B2 with the medium desired interest. However, the potential borrowing request A1 has only partial match-making (¥2,000,000) with the potential lending offer B3 with the highest desired interest (FIG. 3).

Table 2

Potential borrower	Potential lender	Withdrawal order
Company A1 Desired amount, ¥10,000,000 Interest rate condition, 5% or less	Investor B1 Financing amount, ¥3,000,000 Determined interest rate 3%	1
	Investor B2 Financing amount, ¥5,000,000 Determined interest rate 4%	2
	Investor B3 Financing amount, ¥2,000,000 Determined interest rate 5%	3
	Investor B4 Rejected	

[0036] Since the lending interests of the investors B1 to B3 are different, the withdrawal priority in case of bankruptcy of the borrower is given sequentially from the lowest interest (B1).

[0037] When matchmaking is given by the matchmaking section 28 in the above way (S10), the given matchmaking plan is fed back to the borrowing agent 22 and lending agent 24 (S13) and examined by the entity of the potential borrowing request and the entities of the potential lending offers (FIG. 15). In examining the matchmaking plan, the entities of the potential borrowing requests and potential lending offers can read, through the borrowing and lending agents 22 and 24, the pieces of background information of the potential borrowing requests and potential lending offers stored in the background information file 46 (S14). If no matchmaking is given, this reading is not done.

[0038] When the matchmaking plan is approved by all of the entities of the potential borrowing requests and potential lending offers (S15), an agreement is made (S19). However, any one of the entities of the potential borrowing requests and potential lending offers does not agree to (declines) the matchmaking plan, the matchmaking section 28 performs matchmaking again (S9) while excluding a predetermined condition (S16). In this example, when the investor B3 declines the matchmaking plan because the predetermined lending amount is not satisfied, matchmaking is done again while excluding the corresponding potential lending offer. As a result, determination is done as shown in Table 3.

Table 3

Potential borrower	Potential lender	Withdrawal order
Company A1 Desired amount, ¥10,000,000 Interest rate condition, 5% or less	Investor B1 Financing amount, ¥3,000,000 Determined interest rate 3%	1
	Investor B2 Financing amount, ¥5,000,000 Determined interest rate 4%	2
	Investor B3 Financing amount, ¥0 Determined interest rate 0%	-
	Investor B4 Rejection	-

[0039] On the other hand, no matchmaking is given by the matchmaking section 28 (S10), the potential borrowers and lenders are asked about participation in the next auction. If an intent to participate is confirmed, registration in the borrowing request file 42 or lending offer file 44 can be maintained (S12). Alternatively, when no matchmaking is given, registration for participation in the next auction may be automatically maintained.

[0040] Even when the matchmaking is given by the matchmaking section 28, and the matchmaking plan is declined by the potential borrower or lender (S15), the potential borrower or lender is asked about participation in the next auction, as described above. If an intent to participate is confirmed, registration in the borrowing request file 42 or lending offer file 44 can be maintained (S12). Alternatively, when the matchmaking plan is declined by the potential borrower or lender, registration for participation in the next auction may be automatically maintained, as described above.

[0041] As the second example of the financial auction, a case wherein two potential borrowing requests A1 (company A1) and A2 (company A2) and five potential lending offers B1 to B5 (investors B1 to B5) are subjected to matchmaking, as shown in Table 4, will be described in detail with reference to FIG. 10 (many-to-many matching scheme).

Table 4

Potential borrower	Potential lender
Company A1 Desired amount, ¥8,000,000 Interest rate condition, 5% or less	Investor B1 Upper limit of loan, ¥5,000,000 Desired interest 3%
	Investor B2 Upper limit of loan, ¥8,000,000 Desired interest 4%
Company A2 Desired amount,	

Table 4 (continued)

Potential borrower	Potential lender
¥10,000,000	
Interest rate condition,	Investor B3
6% or less	Upper limit of loan, ¥8,000,000
	Desired interest 5%
	Investor B4
	Upper limit of loan, ¥10,000,000
	Desired interest 6%
	Investor B5
	Upper limit of loan, ¥10,000,000
	Desired interest 7%

[0042] First, each of the maximum allowable interests (5% or less and 6% or less) of the companies A1 and A2 is compared with each of the desired lending interests (3%, 4%, 5%, 6%, and 7%) of the potential lenders (S60). For the company A1, the investors B4 and B5 fall outside the range and are rejected (S61). If the desired borrowing amount is larger than the desired lending amount (S62), pre-processing is executed for each company, as described above (S63). In this example, pre-processing is unnecessary. Next, the investors are put to the entries sequentially from the upper class (low interest offer) of the offered lending conditions until the amount reaches the desired borrowing amount (S64). Since there are two potential borrowing requests, the entry priority is given to the company A2 with the higher maximum allowable interest. A portion beyond the desired borrowing amount is allotted to the other company A1 (S65). In this way, when the financing amount exceeds the desired borrowing amount of each company, this portion is removed from the entries.

[0043] Thus, matching is determined as shown in Table 5. In this example, the potential borrowing request A2 consequently has whole matchmaking with the potential lending offer B1 with the lowest desired interest and partial matchmaking with the potential lending offer B2 with the medium desired interest. The potential borrowing request A1 has matchmaking with the remaining of the potential lending offer B2 and only partial matchmaking with the potential lending offer B3 with the second lowest desired interest (FIG. 4).

Table 5

Potential borrower	Potential lender	Withdrawal order
Company A1	Investor B1	-
Desired amount, ¥8,000,000	Financing amount, ¥0	
Interest rate condition, 5% or less	Determined interest rate 0%	3
	Investor B2	
	Financing amount, ¥3,000,000	
	Determined interest rate 4%	4
	Investor B3	
	Financing amount, ¥5,000,000	
	Determined interest rate 5%	-
	Investor B4	-
	Rejected	
	Investor B5	
	Rejected	

Table 5 (continued)

Potential borrower	Potential lender	Withdrawal order
Company A2 Desired amount, ¥10,000,000 Interest rate condition, 6% or less	Investor B1	1
	Financing amount, ¥5,000,000	
	Determined interest rate 3%	
		2
	Investor B2	
	Financing amount, ¥5,000,000	
	Determined interest rate 4%	
		-
	Investor B3	
	Financing amount, ¥0	
	Determined interest rate 0%	-
	Investor B4	
	Financing amount, ¥0	
	Determined interest rate 0%	-
	Investor B5	
	Rejected	

[0044] Since the lending (determined) interests of the investors B1 to B3 for the companies are different, the collecting priority (preference) in case of bankruptcy of the borrowers is given sequentially from the lowest interest (B1). If the interests equal, the priority is given sequentially from the largest financing amount.

[0045] When matchmaking is given by the matchmaking section 28 in the above way (S10), the given matchmaking plan is fed back to the borrowing agent 22 and lending agent 24 (S13) and examined by the entities of the potential borrowing requests and the entities of the potential lending offers (FIG. 16), as in the above-described case. The method of coping with declination and retrying matchmaking is the same as described above and a detailed description thereof will be omitted.

[0046] A financial auction is managed in this way.

(Second Embodiment)

[0047] FIG. 5 is a block diagram showing a financial auction system according to another embodiment of the present invention.

[0048] This embodiment is different from that shown in FIG. 1 in that a host apparatus 20 of the financial auction system further comprises a risk calculation section (risk calculation means) 34 for calculating the risk of a potential borrowing request from the background information of the potential borrowing request. In this case, a potential lending offer also includes a maximum allowable risk, so a screening section 26 can select a potential lending offer whose maximum allowable risk is equal to or larger than the calculated risk from potential lending offers and send the selected potential lending offer to a matchmaking section 28.

[0049] For example, when pieces of accounting information (financial statements or the like in the past several years) of the entity of a potential borrowing request are collected as part of background information, the default rate of the entity of the potential borrowing request can be calculated from the accounting information and used as the above-described risk index. The risk can be calculated using a general calculation rule or calculated on the basis of a calculation condition designated by a potential lender for each potential lending offer. In this case, the know-how of financing of the potential lender can be reflected to the calculation rule.

[0050] FIG. 6 is a flow chart showing the process of a financial auction using the system shown in FIG. 5. This will be described below with reference to FIG. 6.

[0051] The user who has accessed the host apparatus 20 from a user terminal apparatus 14 selects a borrowing request or lending offer (S21). If the user is a potential borrower (S22), a potential borrowing request is input from the

terminal apparatus 14 to a borrowing agent 22. The potential borrower is obligated to input pieces of background information (primary information), including accounting, profile, and the like of the potential borrower (entity of the request) to the borrowing agent 22 (S24). These pieces of pieces of primary information are written in a background information file 46 through an information collection section 32. On the other hand, pieces of background information (secondary information) of the potential borrower are acquired/collected through an external agency 16 such as a credit investigation company or rating organization (S24) and written in the background information file 46 through the information collection section 32. Next, the potential borrower inputs pieces of information such as the desired borrowing amount and maximum allowable interest related to the potential borrowing request and a request about screening (S25). These pieces of information are written in a borrowing request file 42.

[0052] On the other hand, if the user is a potential lender (S23), a potential lending offer is input from the terminal apparatus 14 to a lending agent 24. As in the above-described case, the potential lender inputs pieces of background information (primary information) to the lending agent 24. The pieces of input primary information are written in the background information file 46 through the information collection section 32. On the other hand, pieces of background information (secondary information) of the potential lender are acquired/collected through the external agency 16 such as a credit investigation company or rating organization and written in the background information file 46 through the information collection section 32. The potential lender inputs the desired lending amount and desired interest related to the potential lending offer and a request about screening (S25). The request about screening includes the maximum allowable risk and risk calculation condition. These pieces of information are written in a lending offer file 44.

[0053] Next, the risk calculation section 34 calculates the default rate and appropriate interest rate for the entity of a potential borrowing request from the accounting information (S40). In calculating the appropriate interest rate, the bankruptcy time of the company is estimated from the accounting information, and an appropriate interest rate is calculated by equations (1) that represent the discount present value per yen:

$$d = \sum_{i=1}^{T \wedge \tau} \frac{1}{(1+r)^i} (r+\phi) + \frac{1}{(1+r)^T} 1_{(\tau < T)} + \frac{1}{(1+r)^\tau} \Omega_{(\tau)} 1_{(\tau < T)}$$

$$\Omega_{(\tau)} = \left\{ \frac{1}{FD_{\tau}} (CA_{\tau} + FA_{\tau} + PFRA_{\tau} + PVA_{\tau} - RRF_{\tau}) \right\}^1 \cdots (1)$$

where r is the discount rate, ϕ is the risk premium, T is the maturity of financing, τ is the default time counted from the financing start time, $\Omega_{(\tau)}$ is the amount that can be collected from the company at the default time, and d on the left-hand side is the discount present value per yen. " $T \wedge \tau$ " means that a smaller one of the values T and τ is selected. In addition, FD is the fixed liability, CA is the surplus cash, FA is the surplus asset, FRA is the tangible fixed asset, VA is the current asset, and RRF is the reserve for retirement allowance.

[0054] A detailed method of calculating the appropriate interest is as follows. The value of the default time τ can change depending on a scenario that represents a change in economical circumstances in the future. For this reason, the bankruptcy time τ corresponding to each scenario is predicted, the value d is calculated using this value and equations (1), and the expected value of the value d is calculated using the realization probability of each scenario. The risk premium ϕ is determined such that the expected value of d matches the d' which is set by the potential lender. And $r + \phi$ can be defined as an appropriate interest rate. In determining the value d , the potential lender can consider the variance of the values d of the scenarios and set the value d' to become larger for larger variance. The scenario need not always be made by an expert such as an economist and may be a scenario that the economical circumstances in the past several years can emerge every year at the same probability. The appropriate interest calculated here changes depending on the financial contents of the company. The potential lender defines the desired interest in units of companies with reference to the appropriate interest. The desired interest and appropriate interest may match.

[0055] Next, the screening section 26 and matchmaking section 28 perform screening (S28) and matchmaking (S29) related to the potential borrowing request and potential lending offer.

[0056] The screening section 26 performs the above-described screening and also extracts a potential lending offer from the potential lending offers, for which the calculated risk (default rate) of the potential borrowing request falls within the range of the maximum allowable risk.

[0057] Matchmaking (S29) by the matchmaking section 28 will be described next.

[0058] Potential lending offers for which the desired interest is equal to or lower than the maximum allowable interest

of the potential borrowing request are extracted from potential lending offers. Until the desired borrowing amount of the potential borrowing request is satisfied, successful bids are selected from the extracted potential lending offers in ascending order of desired interests. A choice for matchmaking is substantially parallelly done for all potential borrowing requests and potential lending offers registered in the borrowing request file 42 and lending offer file 44.

[0059] When matchmaking is given by the matchmaking section 28 in the above way (S30), the given matchmaking plan is fed back to the borrowing agent 22 and lending agent 24 (S33) and examined by the entity of the potential borrowing request and the entity of each potential lending offer. In examining the matchmaking plan, the entities of the potential borrowing requests and potential lending offers can read, through the borrowing and lending agents 22 and 24, the pieces of background information of the potential borrowing requests and potential lending offers stored in the background information file 46 (S34).

[0060] When the matchmaking plan is approved by all of the entities of the potential borrowing requests and potential lending offers (S25), an agreement is made (S39). However, any one of the entities of the potential borrowing requests and potential lending offers does not agree to the matchmaking plan, the matchmaking section 28 performs matchmaking again (S29) while excluding a predetermined condition (S36). For example, when the entity of a potential lending offer does not agree to a matchmaking plan, matchmaking is done again while excluding the corresponding potential lending offer.

[0061] On the other hand, no matchmaking is given by the matchmaking section 28 (S30), the potential borrowers and lenders are asked about participation in the next auction. If an intent to participate is confirmed, registration in the borrowing request file 42 or lending offer file 44 can be maintained (S32). Alternatively, when no matchmaking is given, registration for participation in the next auction may be automatically maintained.

[0062] Even when the matchmaking is given by the matchmaking section 28, and the matchmaking plan is declined by the potential borrower or lender (S35), the potential borrower or lender is asked about participation in the next auction, as described above. If an intent to participate is confirmed, registration in the borrowing request file 42 or lending offer file 44 can be maintained (S32). Alternatively, when the matchmaking plan is declined by the potential borrower or lender, registration for participation in the next auction may be automatically maintained, as described above.

[0063] A financial auction is managed in this way.

[0064] The host apparatus 20 of the financial auction system according to the embodiment shown in FIG. 1 or 5 can further comprise a time layout section 36 (time layout means), as shown in FIG. 1 or 5. The time layout section 36 combines a potential borrowing request and a potential lending offer such that the requested borrowing maturity of the potential borrowing request matches the offered lending maturity of the potential lending offer. This is performed in the matchmaking process in FIG. 2 or 6.

[0065] For example, as a simplest method, the requested borrowing maturity and offered lending maturity can be set in units of designated periods. With this processing, a potential lending offer can be divided to unit periods and offered to an auction. Matchmaking is easy when the offered lending maturity of the potential lending offer is regarded as a kind of screening condition. If necessary, the requested borrowing maturity and offered lending maturity may be set in units of days. For example, when a borrower wants to obtain a loan of ¥1,000,000 yen for a year, and two lenders can lend ¥1,000,000 yen for a half year, this financing offer can be established.

(Third Embodiment)

[0066] FIG. 7 is a block diagram showing a financial auction system according to still another embodiment of the present invention.

[0067] This embodiment is different from that shown in FIG. 5 in that a host apparatus 20 of a financial auction system further comprises a joint settlement section 50. In this case, a financing record file 48 which stores the borrowers, lenders, financing amounts, interests, and loan maturities of a plurality of made financing offers is formed in a database 40. As the arrangement of the host apparatus 20 shown in FIG. 7, the joint settlement section 50 is added to the arrangement shown in FIG. 5. However, the joint settlement section 50 may be added to the arrangement shown in FIG. 1.

[0068] The joint settlement section 50 comprises repayment amount totalizing means 52 for calculating the total repayment amount for each repayment maturity of a single borrower, and a dividend amount totalizing means 54 for calculating the total dividend amount for each divided period of a single lender. That is, in the joint settlement section 50, instead of defining the repayment amount as a divided amount in units of given financing offers (debts/credits) the repayments of a plurality of requests of a single borrower are totalized, and the dividends of a plurality of offers of a single lender are totalized.

[0069] FIG. 8 is a view showing the concept of joint repayment by two borrowers C1 and C2 and three lenders D1 to D3. The borrower C1 is involved in three financing offers C11 to C13, and the borrower C2 is involved in two financing offers C21 and C22. On the other hand, the lender D1 has a portfolio D11 related to the financing offers C11 and C21,

the lender D2 has a portfolio D21 related to the financing offers C12 and C13, and the lender D3 has a portfolio D31 related to the financing offer C22. The borrowers C1 and C2 only need repay the total amount for each repayment maturity, and the lenders D1 to D3 can receive the total divided amount for each divided period. According to this joint repayment method, the flow of funds can be put together, the business routine can be reduced.

Claims

1. An auction system characterized by comprising:

a section (22) configured to input a plurality of potential borrowing requests each including a desired borrowing amount and a maximum allowable interest;
 a section (24) configured to input a plurality of potential lending offers each including a desired lending amount and a desired lending interest; and
 a section (28) configured to perform matching between the potential borrowing requests and the potential lending offers on the basis of the respective maximum allowable interests and desired lending interests and to make the desired lending amount of a potential lending offer extracted as a result of matching correspond to the desired borrowing amount of a potential borrowing request extracted as a result of matching.

2. An auction system characterized by comprising:

a borrowing intermediacy section (22) configured to receive a potential borrowing request including a desired borrowing amount and a maximum allowable interest;
 a borrowing request storage section (42) configured to register the potential borrowing request;
 a lending intermediacy section (24) configured to receive a plurality of potential lending offers each including a desired lending amount and a desired interest or a rule capable of calculating the desired interest;
 a lending offer storage section (44) configured to register the potential lending offers; and
 a matchmaking section (28) configured to select a set of successful bids in ascending order of the desired interests from the potential lending offers within a range not more than the maximum allowable interest until the desired borrowing amount is satisfied.

3. The system according to claim 2, characterized by further comprising:

a background information storage section (46) configured to store background information of the potential borrowing request; and
 a section (24) configured to allow entities of the potential lending offers to read the background information of the potential borrowing request.

4. The system according to claim 2, characterized by further comprising:

a background information storage section (46) configured to store the background information of the potential borrowing request; and
 a risk calculation section (34) configured to calculate a risk of the potential borrowing request from the background information.

5. The system according to claim 4, characterized in that the risk calculation section (34) is configured to allow entities of the potential lending offers to designate a calculation condition.

6. The system according to claim 4, characterized in that the background information contains accounting information of an entity of the potential borrowing request, and the risk calculation section (34) is configured to calculate a default rate of the entity of the potential borrowing request on the basis of the accounting information.

7. The system according to claim 4, characterized in that each of the potential lending offers includes a maximum allowable risk, and the system further comprises a screening section (26) configured to select a potential lending offer for which the risk calculated by the risk calculation section (34) falls within a range of the maximum allowable risk from the potential lending offers.

8. The system according to claim 2, characterized by further comprising:

a repayment totalizing section (52) configured to calculate a total repayment amount for each repayment maturity of a single borrower; and
 a dividend calculation/totalizing section (54) configured to calculate a total dividend amount formed from a total of interests and principals for each divided period of a single lender.

9. The system according to claim 1, characterized by further comprising:

a repayment totalizing section (52) configured to calculate a total repayment amount for each repayment maturity of a single borrower; and
 a dividend calculation/totalizing section (54) configured to calculate a total dividend amount formed from a total of interests and principals for each divided period of a single lender.

10. The system according to claim 1, characterized by further comprising:

a background information storage section (46) configured to store the background information of each potential borrowing request; and
 a risk calculation section (34) configured to calculate a risk of each potential borrowing request from the background information.

11. The system according to claim 10, characterized in that the risk calculation section (34) is configured to allow entities of the potential lending offers to designate a calculation condition.

12. The system according to claim 10, characterized in that the background information contains accounting information of an entity of each potential borrowing request, and the risk calculation section (34) is configured to calculate a default rate of the entity of the potential borrowing request on the basis of the accounting information.

13. The system according to claim 10, characterized in that each of the potential lending offers includes a maximum allowable risk, and the system further comprises a screening section (26) configured to select a potential lending offer for which the risk calculated by the risk calculation section (34) falls within a range of the maximum allowable risk from the potential lending offers.

14. An auction method characterized by comprising the steps of:

inputting a plurality of potential borrowing requests each including a desired borrowing amount and a maximum allowable interest;
 inputting a plurality of potential lending offers each including a desired lending amount and a desired lending interest; and
 performing matching between the potential borrowing requests and the potential lending offers on the basis of the respective maximum allowable interests and desired lending interests and making the desired lending amount of a potential lending offer extracted as a result of matching correspond to the desired borrowing amount of a potential borrowing request extracted as a result of matching.

15. An auction method characterized by comprising the steps of:

receiving a potential borrowing request including a desired borrowing amount and a maximum allowable interest;
 registering the potential borrowing request;
 receiving a plurality of potential lending offers each including a desired lending amount and a desired interest;
 registering the potential lending offers;
 extracting a potential lending offer for which the desired interest is not more than the maximum allowable interest from the potential lending offers; and
 selecting a set of successful bids in ascending order of the desired interests from the extracted potential lending offers until the desired borrowing amount is satisfied.

16. The method according to claim 15, characterized by further comprising:

a step of storing background information of the potential borrowing request; and
 a step of calculating a risk of the potential borrowing request from the background information.

17. The method according to claim 16, characterized in that the background information contains accounting information of an entity of the potential borrowing request, and the method further comprises a step of calculating a bankruptcy probability of the entity of the potential borrowing request on the basis of the accounting information.
- 5 18. The method according to claim 13, characterized in that each of the potential lending offers includes a maximum allowable risk, and the method further comprises a step of selecting a potential lending offer for which the maximum allowable risk is not less than the risk from the potential lending offers.
- 10 19. The method according to claim 14, characterized by further comprising:
a step of storing background information of each potential borrowing request; and
a step of calculating a risk of each potential borrowing request from the background information.
- 15 20. The method according to claim 19, characterized in that the background information contains accounting information of an entity of each potential borrowing request, and the method further comprises a step of calculating a bankruptcy probability of the entity of the potential borrowing request on the basis of the accounting information.
- 20 21. The method according to claim 19, characterized in that each of the potential lending offers includes a maximum allowable risk, and the method further comprises a step of selecting a potential lending offer for which the maximum allowable risk is not less than the risk from the potential lending offers.

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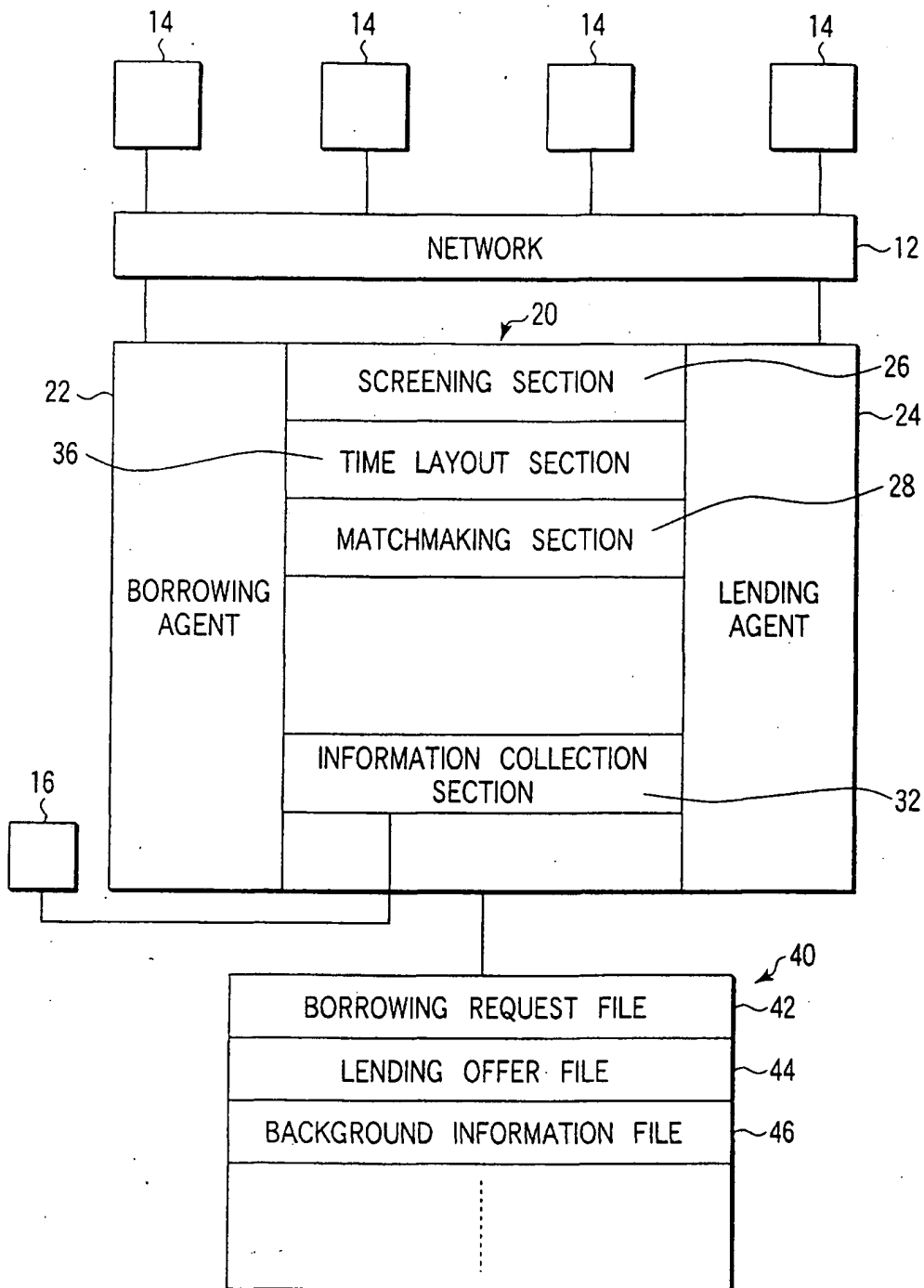
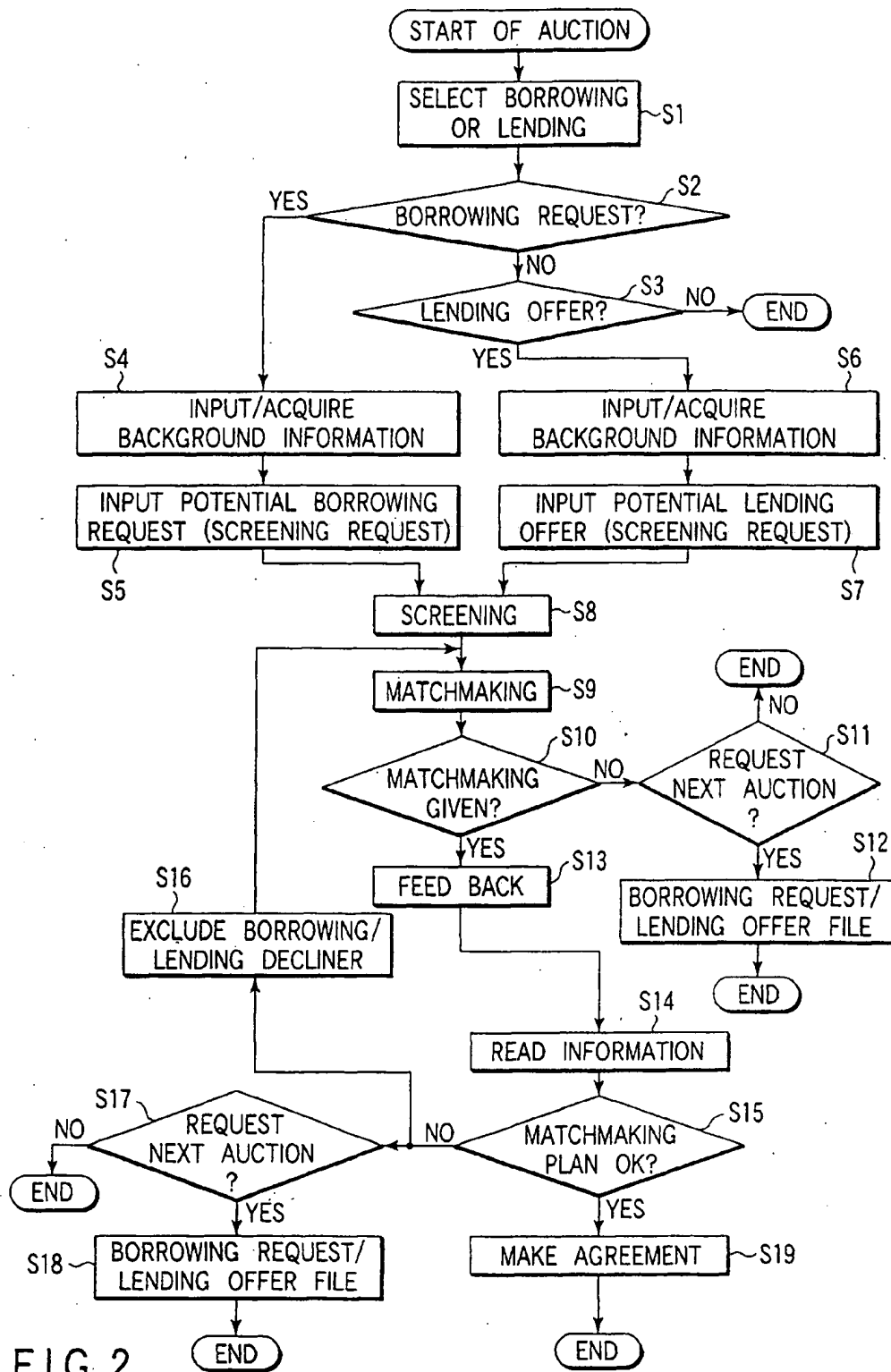


FIG. 1



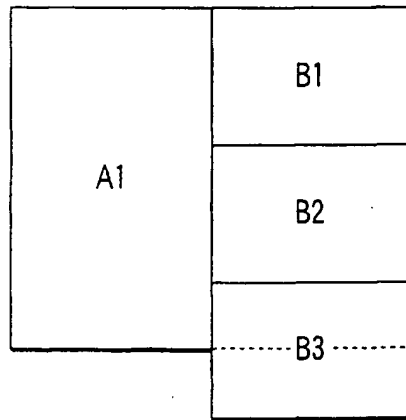


FIG. 3

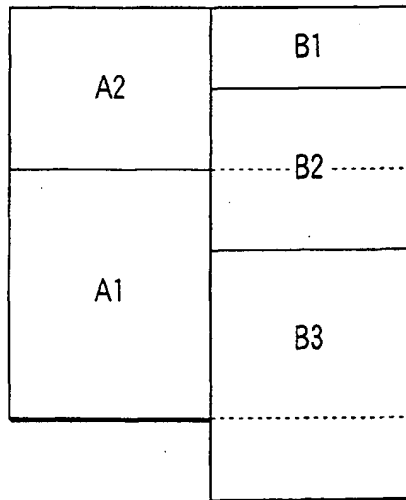


FIG. 4

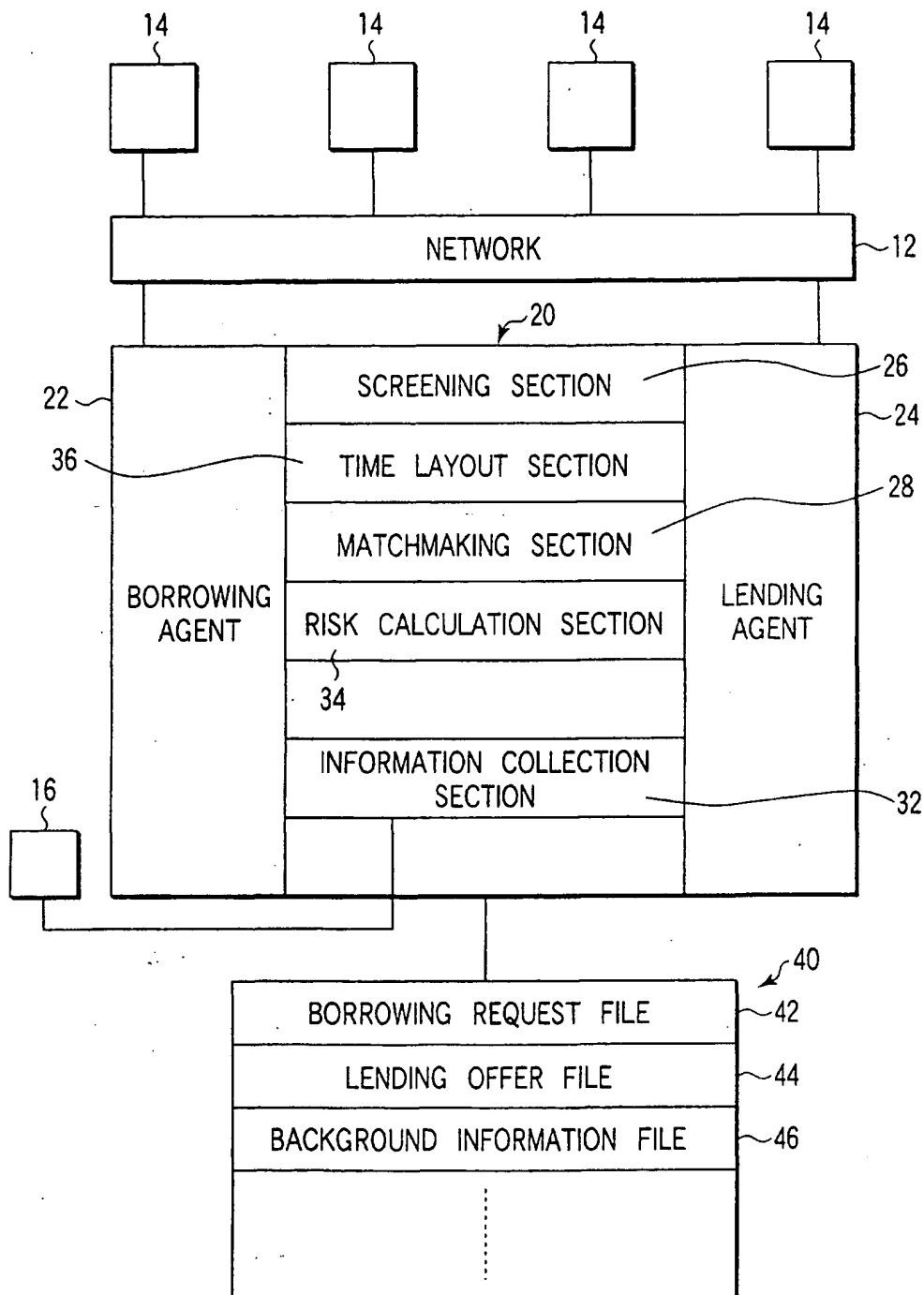
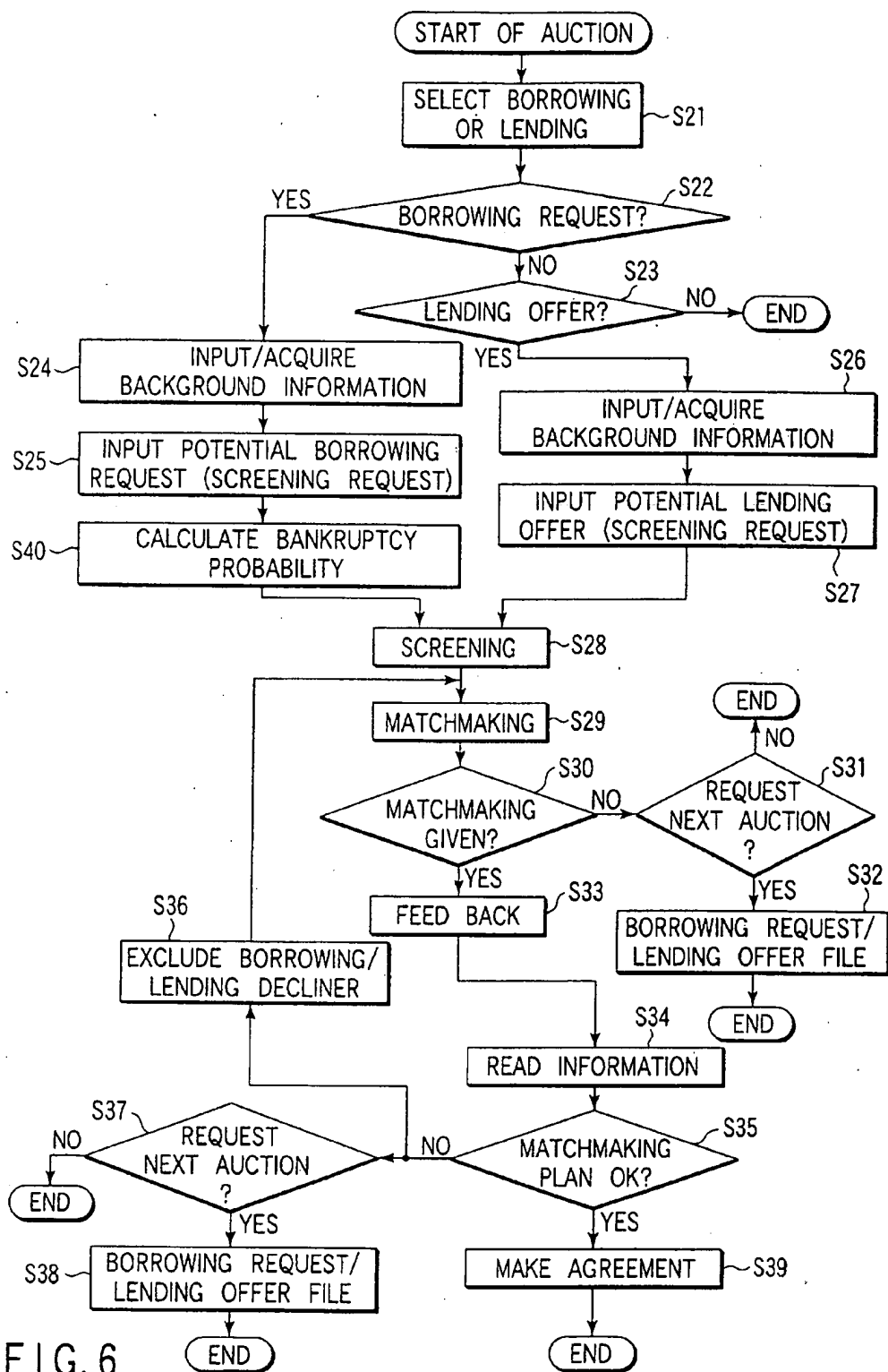


FIG. 5



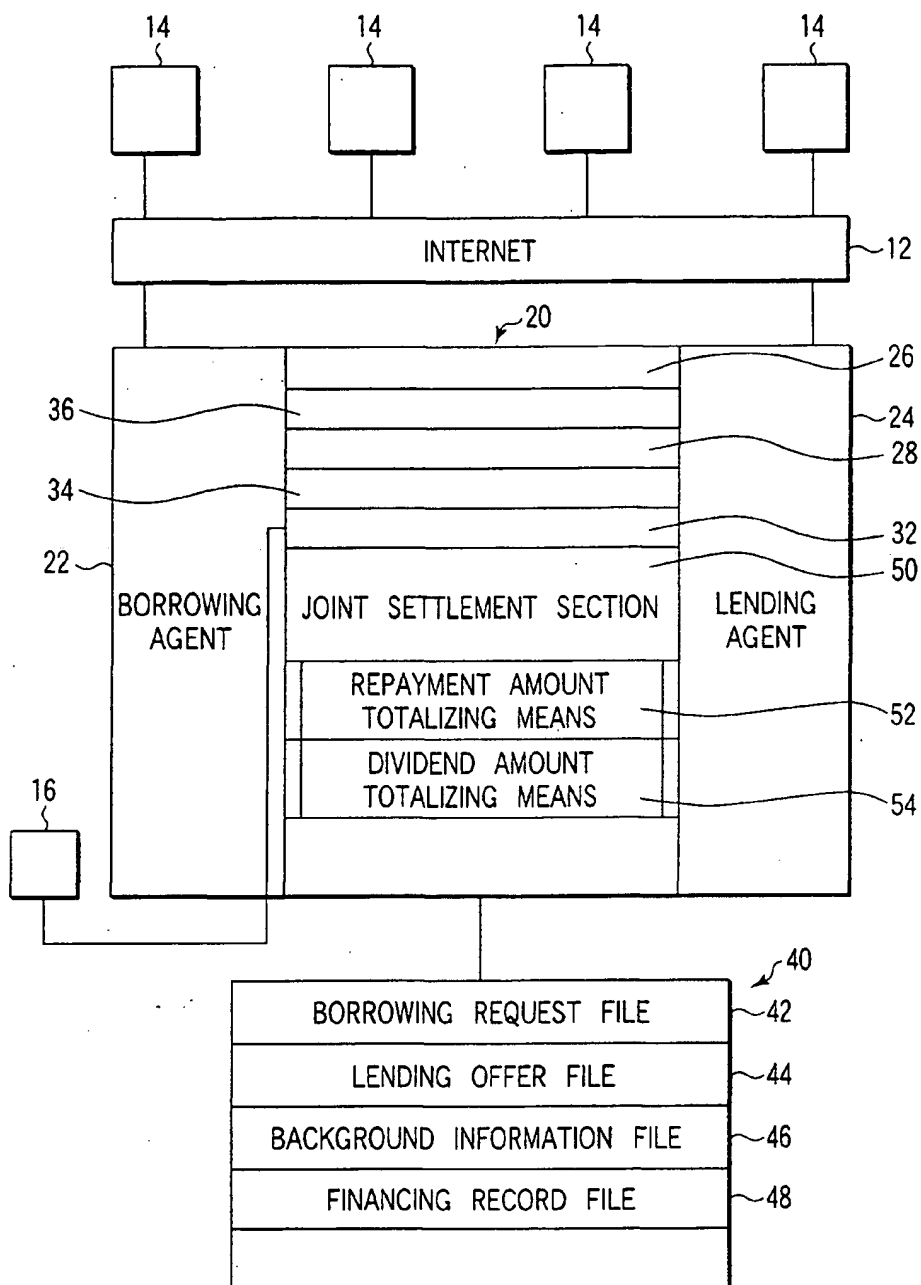


FIG.7

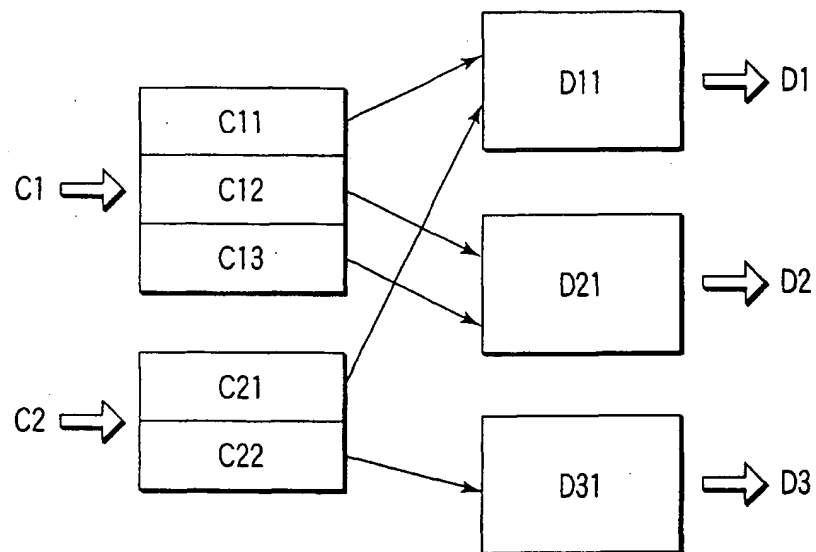


FIG. 8

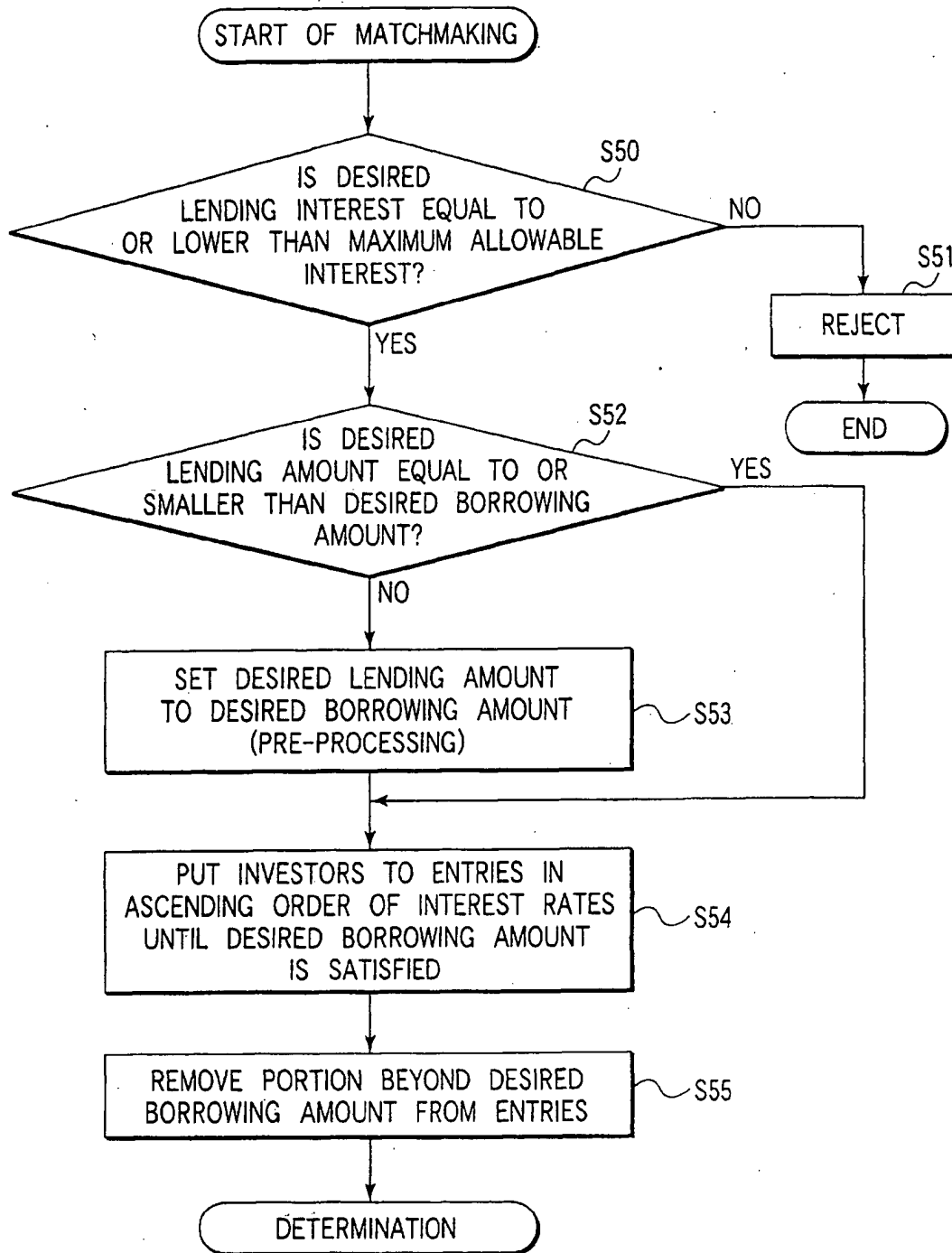


FIG. 9

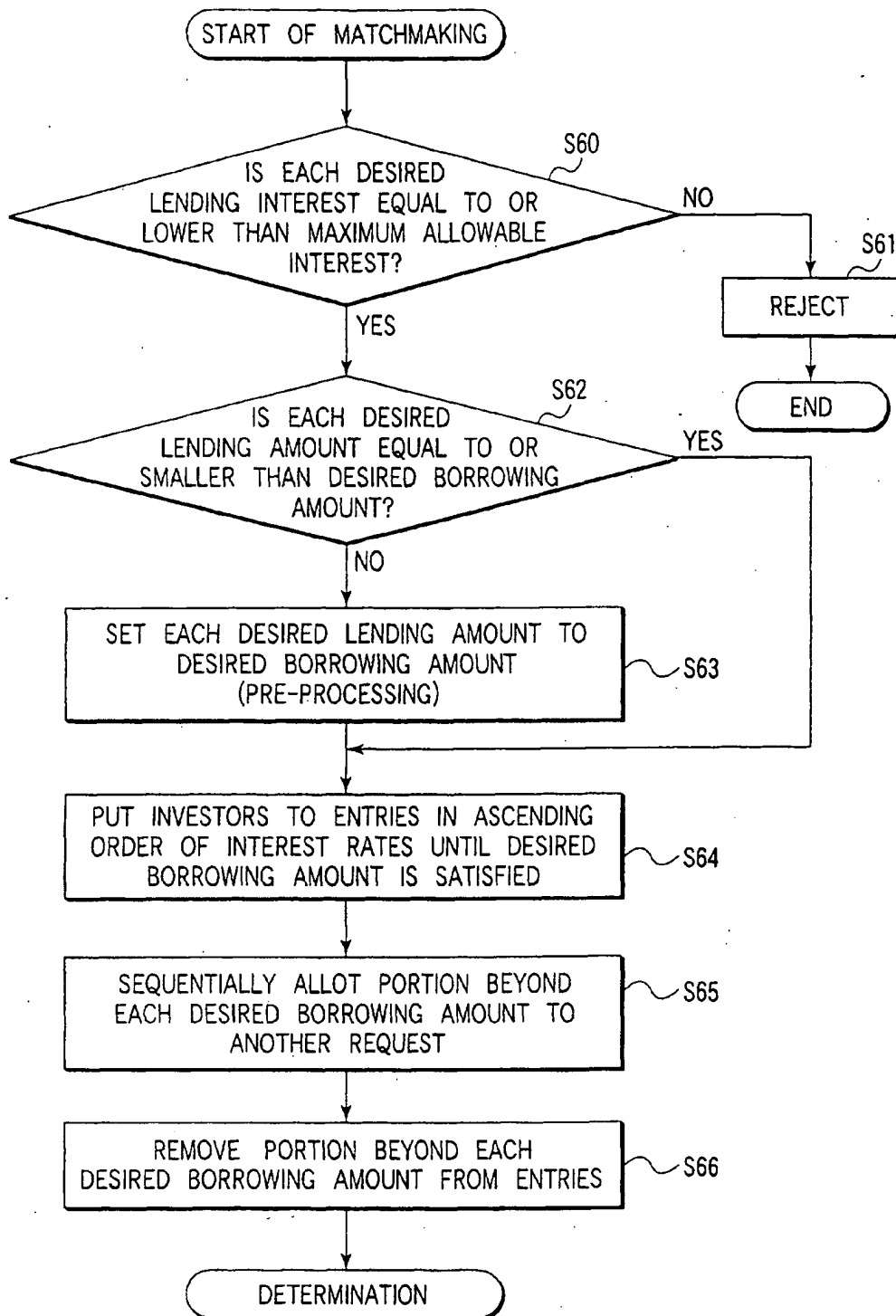


FIG. 10

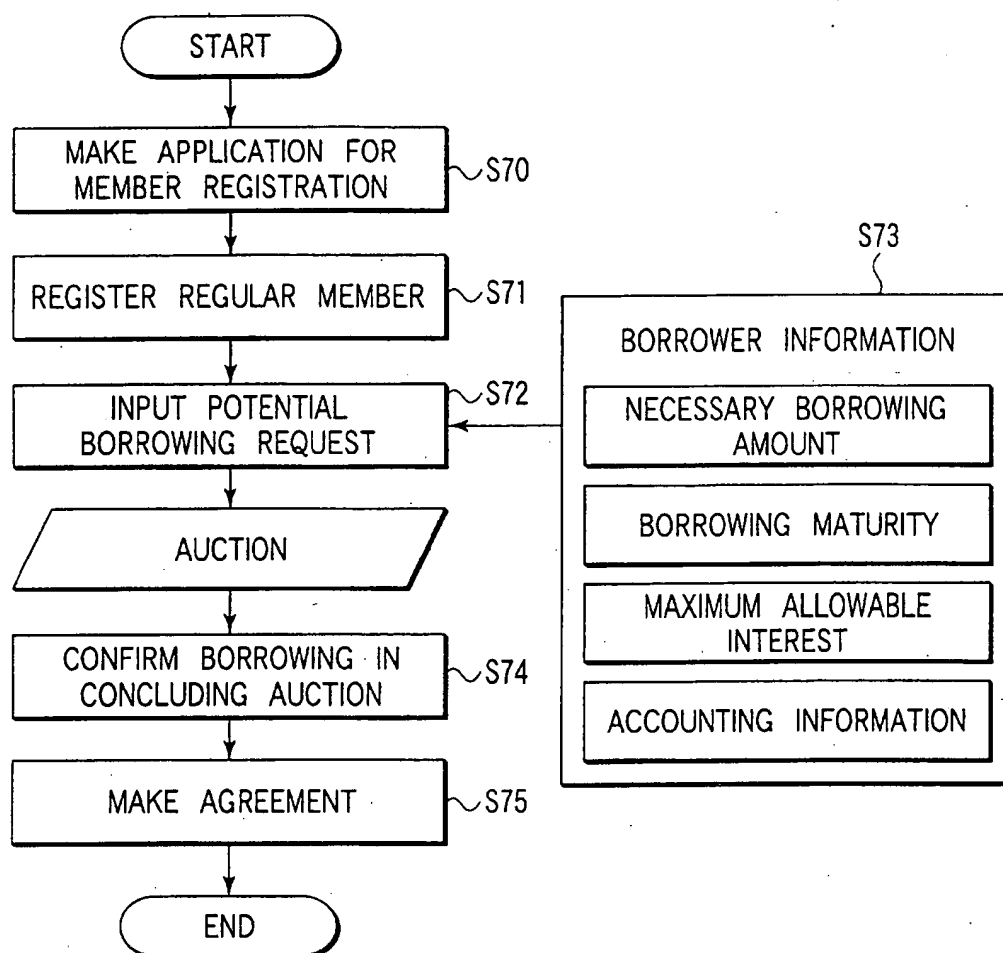


FIG. 11

CYBER FINANCING SYSTEM
APPLICATION FOR MEMBERSHIP

INPUT INFORMATION AND CLICK APPLICATION BUTTON

NAME OF COMPANY :	AOI ELECTRIC
ADDRESS :	1-1-1, CHUO-KU, TOKYO
NAME OF PRESIDENT :	IEYASU MATSUDAIRA
NAME OF PERSON IN CHARGE :	HIKOZAEMON OKUBO
TELEPHONE NUMBER :	03-123-4567
NUMBER OF EMPLOYEES :	10,000
INDUSTRIAL CLASSIFICATION :	COMPUTER
	<input type="button" value="APPLICATION"/> <input type="button" value="CANCEL"/>

FIG.12

ACCOUNTING INFORMATION OF AOI ELECTRIC, 1999

DO YOU SEND THE FOLLOWING ACCOUNTING INFORMATION
TO THE CYBER FINANCING SYSTEM?

<u>BALANCE SHEET</u>		<u>INCOME STATEMENT</u>
<p>ASSETS SECTION LIABILITIES SECTION</p> <p>CURRENT ASSETS CURRENT LIABILITIES</p> <p>FIXED ASSETS FIXED LIABILITIES</p> <p>STOCKHOLDERS' EQUITY SECTION</p> <p>CAPITAL STOCK</p> <p>LEGAL SURPLUS</p> <p>OTHER SURPLUS</p> <p>TOTAL ASSETS TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY</p>	<p>ORDINARY INCOME SECTION</p> <p>OPERATING REVENUES AND EXPENSES</p> <p>SALES</p> <p>COST OF SALES</p> <p>SELLING AND GENERAL ADMINISTRATIVE EXPENSES</p> <p>OPERATING INCOME</p> <p>NON-OPERATING REVENUES AND EXPENSES</p> <p>ORDINARY INCOME</p>	

TRANSMIT

CANCEL

FIG.13

CYBER FINANCING SYSTEM
APPLICATION FOR BORROWING REQUEST

INPUT INFORMATION AND CLICK APPLICATION BUTTON

MEMBERSHIP NUMBER :	1234567
PASSWORD :	* * * * *
NAME OF COMPANY :	AOI ELECTRIC
BORROWING AMOUNT :	¥10,000,000
BORROWING MATURITY :	2000/4/1-2001/3/31
MAXIMUM ALLOWABLE INTEREST :	3.5%
PURPOSE :	RESEARCH AND DEVELOPMENT
	<input type="button" value="APPLICATION"/> <input type="button" value="CANCEL"/>

FIG.14

CYBER FINANCING SYSTEM
CONFIRMATION OF AGREEMENT

MATCHING IS ESTABLISHED. DO YOU MAKE AGREEMENT?

MEMBERSHIP NUMBER:	1234567
NAME OF COMPANY:	AOI ELECTRIC
BORROWING AMOUNT:	¥10,000,000
BORROWING MATURITY:	2000/4/1-2001/3/31
INTEREST RATE:	3.1%

FIG.15

CYBER FINANCING SYSTEM
CONFIRMATION OF AGREEMENT

MATCHING IS GIVEN. DO YOU MAKE AGREEMENT?

DETAILS	AOI ELECTRIC	¥3,000,000	2000/4/1-2001/3/31	3.1%
DETAILS	TACHIBANA MACHINERY	¥1,000,000	2000/4/1-2000/9/31	3.2%
DETAILS	TSUBAKI PHARMACEUTICAL	¥300,000	2000/4/1-2001/3/31	3.0%
DETAILS	MOMO MILK PRODUCT	¥200,000	2000/6/1-2001/3/31	4.0%
DETAILS	KAKI SHOKAI	¥1,000,000	2000/8/1-2001/3/31	1.2%
DETAILS	RINGO BANK	¥200,000	2000/2/1-2001/3/31	9.8%

AGREEMENT

CANCEL

FIG. 16